# CHAPTER 21. HEARING CONSERVATION PROGRAM

**2100. GENERAL.** This chapter establishes minimum requirements for a Federal Aviation Administration (FAA) Hearing Conservation Program (HCP) as required by 29 CFR 1910.95, Occupational Noise Exposure. Additional implementation guidance will be developed by responsible organizations to support this policy, and shall be followed.

**2101. BACKGROUND.** Exposure to high levels of noise can cause hearing loss. The nature and extent of the hearing loss depends upon the intensity and frequency of the noise and the duration of the exposure. Noise-induced hearing loss may be temporary or permanent. Temporary loss results from short-term exposure to noise. Normal hearing returns after a period of rest. If exposures continue for extended periods of time, the temporary losses may become permanent. Noise-induced hearing loss resulting from prolonged exposure is irreversible, but it can be arrested and it can be prevented. The OSHA noise standard and the HCP prescribed in this chapter are designed to identify potentially hazardous noise areas or occupations, to reduce the noise to acceptable levels, if feasible, and, if not, to provide proper protection and monitoring for those employees who are exposed.

**a. Exposure criteria.** The OSHA noise standard requires every employer to establish and administer a continuing HCP for all employees whose 8-hour time-weighted average (TWA) noise exposures equal or exceed an “action level” of 85 dBA. The OSHA noise standard established 90 dBA as the 8-hour TWA permissible noise exposure for continuous noise, with allowable increases of 5 dBA for each halving of exposure duration, up to a maximum of 115 dBA (Figure 21-l).

**b. Engineering controls as first line of defense.** The OSHA noise standard specifies that feasible administrative or engineering controls shall be utilized to reduce sound levels within the levels shown in Figure 21-1, and, if such controls fail to accomplish that reduction, personal protective equipment shall be provided and a continuing effective HCP administered. The employer must provide hearing protection for affected employees, institute workplace and/or employee exposure monitoring, provide employees with training, and establish an audiometric testing program.

**2102. CANCELLATION.** FAA Order 3910.04, Hearing Conversation Program, dated September 13, 1985, is cancelled.

**2103. SCOPE.** This chapter applies to all FAA personnel whose work duties include potential for exposure to workplace noise levels that meet or exceed those specified in the OSHA noise standard.

**2104. GOALS AND OBJECTIVES.** The goal of the FAA HCP is to safeguard employees' health by protecting employees from exposure to noise hazards in the workplace. This will be accomplished as far as feasible by accepted engineering control measures. When accepted engineering controls are not feasible, or while they are being established, appropriate hearing protection shall be used as specified in this chapter and associated guidance.

**2105. DEFINITIONS.**

**a. Action Level (AL).** An 8-hour time-weighted-average noise level of 85 dBA or, equivalently, a noise dose of 50 percent, at which the agency must notify affected employees, develop and implement employee exposure monitoring programs, administer continuing, effective hearing conservation programs, and make hearing protectors available to affected employees.

**b. Administrative control.** A procedure or policy exercised by a supervisor for protecting employees from harmful noise levels by limiting their exposure time.

**c. Area monitoring.** Measuring noise levels with sound level meters or noise dosimeters at different locations in the workplace and at different times during the work shift sufficient to make reliable estimates of employee noise exposures.

**d. Audiogram.** A chart, graph, or table resulting from an audiometric test showing an individual's hearing threshold levels as a function of frequency.

**e. Audiologist.** A professional, specializing in the study and rehabilitation of hearing, who is certified by the American Speech-Language-Hearing Association or licensed by a state board of examiners.

**f. Baseline audiogram.** The audiogram against which future audiograms are compared.

**g. Continuous noise.** Broadband noise of approximately constant level and spectrum, to which an employee is exposed for a period of eight hours per day, 40 hours per week.

**h. dBA.** Sound level in decibels read on the A-scale of a sound level meter. The A-weighing network discriminates against lower and higher frequencies (and for some of the middle frequencies) of an acoustic signal. The A-Weighing network correlates with the response of the human ear to noise at various frequencies.

**i. Decibel (dB).** A unit related to the logarithm of the ratio of a measured quantity to a reference quantity. It is commonly used to describe levels of sound power, sound pressure, electric voltage, electric power, etc.

**j. Engineering control.** A means of protecting employees from harmful noise levels by reducing the noise before it reaches the exposed employee by mechanical intervention or design criteria.

**k. Hearing loss.** A Standard Threshold Shift (STS) which is a change in hearing threshold by an average of 10 decibels (dB) or more at 2,000, 3,000, and 4,000 hertz (Hz) in either ear relative to the current reference baseline.

**l. Hertz (Hz).** Unit of measurement of frequency numerically equal to cycles per second (cps). l Hz = l cps.

**m. High noise area.** Any area where the cumulative noise exposure to employees is above 85 dBA TWA, or a 50% dose.

**n. Impulse noise.** Noise that is characterized by a sharp rise in sound pressure level to a high peak followed by a rapid decay (e.g., drop forge or gunshot).

**o. Intermittent noise.** Noise that ceases or subsides between events (e.g., aircraft flyovers).

**p. Noise dosimeter.** A device, worn by an employee that integrate measurements of sound pressure levels over a period of time in such a manner that it directly indicates the accumulated exposure (dose) and other indices that can be calculated from noise measurements.

**q. Noise measurement.** A measurement obtained through the integration of all continuous, intermittent, and impulse sound levels from 80 to 130 decibels for the duration of an employee’s exposure.

**r. Noise Reduction Rating (NRR).** The NRR, which indicates a hearing protector’s noise reduction capabilities, is a single-number rating (units are in dB) that is required by law to be shown on the label of each hearing protector sold in the United States.

**s. Otolaryngologist.** A physician specializing in diagnosis and treatment of disorders of the ear, nose and throat.

**t. Personal monitoring.** Measuring employee noise exposure with a noise dosimeter mounted on the employee and the dosimeter microphone positioned near the employee's ear.

**u. Qualified audiometric technician.** A technician who has been certified by the Council for Accreditation in Occupational Hearing Conservation, or one who has satisfactorily demonstrated competence in administering audiometric examinations, obtaining valid audiograms, and properly using, maintaining, and checking calibration and proper functioning of the audiometers being used. The audiometric technician must be supervised by an audiologist, otolaryngologist, or physician.

**v. Revised baseline.** An annual audiogram that has been substituted for the baseline audiogram, when, in the judgment of the audiologist, otolaryngologist, or physician who is evaluating the audiogram, the STS revealed by the audiogram is persistent, or the hearing threshold shown in the annual audiogram indicates significant improvement over the baseline audiogram. (Reference 29 CFR 1910.95(g)(9).

**w. Sound level.** The sound pressure level reported in decibels.

**x. Sound level meter.** A device that measures in decibels the intensity of sound at a given moment.

**y. Standard Threshold Shift (STS).** A change in hearing threshold relative to the baseline audiogram of 10 decibels or more at 2000, 3000, and 4000 hertz (Hz) in either ear.

**z. Time-weighted average (TWA) sound level.** That sound level, which if constant over an 8-hour exposure, would result in the same noise dose or sound level as is measured.

**2106. KEY PROGRAM ELEMENTS.** The program must be administered by a suitably trained HCP administrator (hereafter referred to as “program administrator.”) A program administrator for each affected line of business shall be appointed in writing to administer overall implementation and oversight of the HCP for all applicable FAA lines of business, both at headquarters and in the regions/centers. The HCP administrator shall meet the requirements for a technically qualified safety professional as contained in 3900.19B, Chapter 1, paragraph 11h.

**a. Written Hearing Conservation Program.** Prior to a FAA employee’s inclusion in the HCP, a written, worksite-specific hearing conservation program must be developed and implemented in accordance with the specific requirements of 29 CFR 1910.95. This program must be updated as necessary to reflect those changes in workplace conditions that affect noise exposure and/or the use of hearing protection devices, and must contain at least the elements in paragraphs 2106 b through h.

**b. Noise Evaluation and Monitoring.**

**(1)** Occupational noise exposure levels shall be monitored by a technically qualified safety professional in a manner that is consistent with 29 CFR 1910.95, and so as to identify employees who are exposed to levels equal to or greater than the 85 dBA, 8-hour TWA (50 per cent dose) Action Level (AL). Measurements shall be made with a sound level meter on the A-Weighing scale, slow response, or a dosimeter.

**(2)** All continuous, intermittent, and impulsive sound levels from 80 dB to 130 dB shall be integrated into the noise measurements. Although area monitoring is permitted, personal dosimetry monitoring is preferred. Employee representatives shall be permitted to observe monitoring procedures and shall be notified of the results.

**(3)** When monitoring reveals that the 8-hour TWA exposure level is:

**(a)** Less than 85 dBA (or 50 per cent dose), no further action is required.

**(b)** Equal to or greater than the AL, the affected employee(s) shall be provided hearing protection and placed in a Hearing Conservation Program.

**(4)** Measurement of potentially hazardous sound levels shall be conducted when any information, observation, or calculation shows that an employee could be exposed to a noise level in excess of 85 dBA TWA. This includes, but is not limited to times where there is a need to document representative noise exposures, where employees complain of excessive noise, or where it is difficult to understand a normal conversation when the speaker and listener face each other at a distance of two feet. Noise monitoring should be repeated whenever any changes to facilities, equipment, work practices, procedures, or noise control measures alter potential noise exposures.

**(5)** Any new equipment (including communication headsets), operation, job, or procedure with the potential for creating work shift noise levels above 85 dBA TWA shall be evaluated with regard to noise emissions prior to startup.

**c. Noise Control.**

**(1) Engineering controls.**

**(a)** Engineering controls shall be utilized, where feasible, to reduce employee noise exposures.

**(b)** Facilities and equipment shall be procured, designed, operated, and/or modified in such a manner as to minimize exposure to noise levels above 85 dBA. Consideration of noise exposures shall be made as early as possible in the procurement, design, and/or modification decisionmaking process.

**(2) Personal hearing protection**.

**(a)** Personal hearing protection is to be used where engineering controls are not feasible, are not practical, or fail to reduce noise exposure to levels below 85dBA TWA.

**(b)** Earmuffs and/or earplugs shall be required to be worn by employees exposed to continuous, intermittent, or impact noise in excess of 85 dBA, without regard for duration of exposure or character of the noise source.

**(c)** Use of hearing protection shall be mandatory where requirements are posted, and their use shall be enforced by supervisors as specified in this chapter.

**(d)** Where applicable, communication headsets used by employees shall be equipped with either zener diode or other similar type of circuitry that limits feedback signals, or tones, to acceptable levels in accordance with OSHA guidelines without compromising clear communication.

**(e)** Earplugs and earmuffs shall be for the exclusive use of each employee and shall not be traded or shared.

**(f)** Hearing protectors shall attenuate noise exposure (at the ear) to a level of 85 dBA-TWA or below, based on the Noise Reduction Rating (NRR) of the protector. Estimation of the adequacy of hearing protector attenuation shall be performed according to OSHA-specified methods. The adequacy of hearing protector attenuation shall be re-evaluated whenever employee noise exposures increase to the extent that the hearing protector currently in use may no longer provide adequate attenuation. More

effective hearing protectors shall be provided when necessary. Refer to 29 CFR 1910.95 Appendix B (mandatory), "Methods for Estimating the Adequacy of Hearing Protector Attenuation" for additional information.

**(g)** When it is determined that hearing protection is necessary, employees will be offered a selection of suitable protection devices from which they will select the one for use.

**(h)** Special hearing protection equipment, such as sound-attenuating communication headsets, may be used in high-noise areas. These devices should be regularly inspected. Sound-attenuating headsets, which have been damaged, altered, or modified in any way that affects the attenuation characteristics, may not be used. Where replacement parts, such as earcup seals are available, the headsets may be repaired and reused. Where sound attenuating headsets are not permanently issued to individuals, such equipment must be cleaned before being reissued.

**(i)** Supervisors shall ensure that hearing protectors are available to employees in the HCP, that employees are trained in their use and care, and that the hearing protectors are worn.

**(3) Administrative controls.**

**(a)** Where the highest rated hearing protective equipment or engineering controls (or a combination of both) are not sufficient to attenuate noise exposure to less than 90 dBA TWA, an employee's duration of time spent in the noise hazard area shall be limited so as not to exceed the default maximum exposure limit (with hearing protection) of 90 dBA TWA.

**(b)** For employees who have demonstrated a persistent Standard Threshold Shift, this exposure limit is reduced to 85 dBA TWA in accordance with 29 CFR 1910.95.

**d. Medical Evaluation.**

**(1) Audiometric testing.**

**(a)** The audiometric testing program shall be conducted in accordance with 29 CFR 1910.95(g) and (h), and the provisions of FAA Order 3900.19B, Chapter 12, Medical Surveillance Program, and shall include baseline and annual audiometry for all employees in the HCP. Requirements for testing are contained in the following mandatory appendices:

- 29 CFR 1910.95 App C, Audiometric measuring instruments.
- 29 CFR 1910.95 App D, Audiometric test rooms.
- 29 CFR 1910.95 App E, Acoustic calibration of audiometers.

**(b)** Testing shall be performed by a certified audiometric technician, under the direction of the medical officer in charge, or by a consultant who specializes in audiometric examinations.

**(c)** The medical officer in charge shall review audiograms in compliance with 29 CFR 1910.95(g) as needed to determine whether there is a need for further evaluation or referral.

**(d)** The audiometric tests performed for employees who hold Class 1 or 2 medical certificates shall be acceptable in satisfying this requirement.

**(2) Baseline audiograms.**

**(a)** Where feasible, baseline audiograms shall be obtained prior to an employee's first exposure to noise that equals or exceeds the action level. If not feasible, it shall be obtained as soon as

possible, but no longer than 6 months, after it becomes known that the employee is or will be exposed to noise that equals or exceeds the action level.

**(b)** Baseline audiograms obtained prior to the effective date of this chapter are acceptable baselines provided the medical officer in charge judges them valid.

**(c)** An annual audiogram may be substituted for the baseline at the discretion of the medical officer in charge in accordance with paragraph 29 CFR 1910.95(g)(9) of the standard.

**(3) Annual audiograms.**

**(a)** Annual audiograms shall be compared to the baseline audiogram to determine if an employee's audiogram is valid and if a standard threshold shift (STS) has occurred.

**(b)** If an STS is identified, the employee shall be informed of this fact in writing within 21 days of the determination and shall be fitted or refitted with adequate hearing protectors and required to wear them in noise areas that are equal to or greater than the AL. In addition, the employer may retest the employee within 30 days if an annual audiogram shows that an employee has suffered a STS.

**(c)** An annual audiogram may be substituted for the baseline at the discretion of the medical officer in charge in accordance with paragraph 29 CFR 1910.95(g)(9) of the standard.

**(d)** Upon termination or retirement, an exit audiogram shall be conducted.

**(e)** Annual audiograms conducted as part of air traffic controller medical exams will satisfy this requirement.

**e. Training.**

**(1)** All employees subject to the HCP and their supervisors shall receive training consistent with the requirements of 29 CFR 1910.95(k). Training shall include:

**(a)** The effects of noise on hearing.

**(b)** The purpose of hearing protection.

**(c)** The advantages, disadvantages, and attenuation of various hearing protective devices and instruction on selection, fitting, use and care.

**(d)** The mandatory requirement to wear hearing protection, and administrative actions which may follow for failure to wear the protection.

**(e)** The purpose of audiometric testing, an explanation of the test procedures, and the nature of the test results they are entitled to receive.

**(f)** Procedures to employ in donning and doffing hearing protection.

**(2)** Training shall be provided at the time of an employee’s initial assignment to a task in an area with high noise levels, and refresher training shall be provided annually for each employee in the HCP.

**(3)** All training shall be properly documented in the appropriate official training information system. Documentation shall include a written certification record that contains the name or other

identifier of the employee trained, the date(s) of the training, and the signature of the person who performed the training.

**(4)** A general awareness program shall be provided for supervisory and managerial personnel whose employees are exposed above the action level, emphasizing their responsibility in the HCP.

**f. Recordkeeping.**

**(1)** Audiometric test results shall be maintained for the duration of the employee's employment. The audiometric record shall include:

**(a)** Name and job classification of the employee.

**(b)** Date of the audiogram.

**(c)** Examiner's name.

**(d)** Date of the last acoustic or exhaustive calibration of the audiometer.

**(e)** Employee's most recent noise exposure assessment.

**(f)** Date of the last hearing conservation training and the name of the person conducting the training.

**(g)** A copy of the STS notice.

**(2)** Noise exposure measurement records shall be maintained for a minimum of two years, or until the next noise exposure measurement tests are conducted and reported.

**(3)** All noise exposure measurement and audiometric records shall be provided upon request to employees, former employees, representatives designated by the employee, and OSHA in accordance with 29 CFR 1910.1020 and privacy act requirements.

**(4)** Employee training records may be destroyed when 5 years old or when superseded or obsolete, whichever are sooner, in accordance with approved records retention standards in FAA Order 1350.15.

**g. Posting of Personal Hearing Protection Requirements.**

**(1)** Caution signs, which clearly indicate the hazard of high noise levels and state the requirements to wear hearing protection shall be posted at the entrance(s) to, or the periphery of, noise hazard areas.

**(2)** Decals or placards with similar statements shall be affixed to power tools and machines where noise exposures may be anticipated to exceed 85 dBA TWA.

**h. Contracts.**

**(1)** All contracts issued for work involving anticipated noise exposure shall contain a provision that contractors must have a Hearing Conservation Program in accordance with OSHA and state requirements. The HCP Administrator or designated representative must approve the contractors HCP

before any work is initiated. Copies of contractors' safety programs shall be submitted in accordance with contract requirements.

**(2)** Contractors must provide their own appropriate audiometric testing, personal protective equipment, and training.

**(3)** Contractors must wear personal protective equipment where required.

**Figure 21-1: PERMISSIBLE NOISE EXPOSURE**

| Sound Level, L (dBA) | Reference Duration, T* (hours) |
|---|---|
| 80 | 32.0 |
| 81 | 27.9 |
| 82 | 24.3 |
| 83 | 21.1 |
| 84 | 16.4 |
| 85 | 16.0 |
| 86 | 13.9 |
| 87 | 12.1 |
| 88 | 10.6 |
| 89 | 9.2 |
| 90 | 8.0 |
| 91 | 7.0 |
| 92 | 6.1 |
| 93 | 5.3 |
| 94 | 4.6 |
| 95 | 4.0 |
| 96 | 3.5 |
| 97 | 3.0 |
| 98 | 2.6 |
| 99 | 2.3 |
| 100 | 2.0 |
| 101 | 1.7 |
| 102 | 1.5 |
| 103 | 1.3 |
| 104 | 1.1 |
| 105 | 1.0 |

| Sound Level, L (dBA) | Reference Duration, T* (hours) |
|---|---|
| 106 | 0.87 |
| 107 | 0.76 |
| 108 | 0.66 |
| 109 | 0.57 |
| 110 | 0.50 |
| 111 | 0.44 |
| 112 | 0.36 |
| 113 | 0.33 |
| 114 | 0.29 |
| 115** | 0.25 |
| 116 | 0.22 |
| 117 | 0.19 |
| 118 | 0.16 |
| 119 | 0.14 |
| 120 | 0.125 |
| 121 | 0.11 |
| 122 | 0.095 |
| 123 | 0.082 |
| 124 | 0.072 |
| 125 | 0.063 |
| 126 | 0.054 |
| 127 | 0.047 |
| 128 | 0.041 |
| 129 | 0.036 |
| 130 | 0.031 |

$$* \ T = \frac{8}{2^{(L-90)/5}}$$

** 115 dBA is the maximum exposure limit